
XXIV. *Musci Nepalenses; or Descriptions of several new Mosses from Nepal.* By William Jackson Hooker, Esq. F. L. S.

Read June 7, 1808.

It is through the kindness of Dr. Smith, who has favoured me with specimens for the purpose, that I have now the honour of laying before the Linnean Society figures and descriptions of such of the mosses gathered by Dr. Francis Buchanan, during his journey to Nepal, as appear to have escaped the attention of former writers on this subject. His collection contained also a few others already published, the names of which I have thought it best to insert, as nothing whatever is at present known respecting the *Muscologia* of that very extensive country.

1. *SPHAGNUM iridans.*

S. iridans. Bridel. *Suppl.* I. p. 20.

S. javense. Bridel. *Hist. Musc.* II. p. 27. t. 6. f. 3.

S. clandestinum. Palisot de Beauvois. *Prod. Æth.* p. 88.

The only specimen that Dr. Smith has received of this is barren. It is most probably a *Dicranum*, as Bridel suspects, and there is a plant with fructification in Mr. Turner's collection,

gathered by Mr. Menzies in New Zealand, so like it, as to be perhaps not distinct.

2. *OCTOBLEPHARUM albidum*. Hedw.

3. *SPLACHNUM squarrosum*.

Splachnum foliis lineari-lanceolatis acuminatis serratis: apice horizontalitè patulis, capsulâ cylindraceâ, apophysî obconicâ.

Caules cæspitiosi, pollicares, vel sesquipollicares, erecti, nunc simplices, nunc basin versùs bifurci; infernè, sicut in Muscis aliis loca turfosa colentibus, tomento nigro-ferrugineo densè obtecti, supernè foliosi. *Folia* lutescenti-viridia, undique laxè disposita, basi imbricata, apice horizontalia, vel etiam recurva, lineari-lanceolata, acuminata, reticulata, margine supra medium argutè et manifestè serrata, nervo crasso, obscuro, in acumen longum, extra paginæ apicem producto, instructa; madore plana, siccitate crispatula. *Pedicellus* terminalis, ferè unguicularis, erectus, strictus, croceus, glaber. *Capsula* luteo-fusca, cylindracea, perbrevis, orâ incrassatâ, in exsiccatis ampliâtâ, apophysî insidens obconicæ, capsulâ paullùm longiori, vix tamen latiori, eique concolori, adeò ut una ægrè ab alterâ dignoscatur. *Peristomium* dentibus sedecim, magnis, luteis, incurvis, transversè striatis, per paria approximatis. *Columella* capsulâ brevior. — Neque calyptram nec operculum hactenùs vidi.

Every other species of *Splachnum* at present described having its leaves either pressed close to the stem, or at least between erect and patent, there can be no difficulty in distinguishing the present, in which they are, both when moist and dry, disposed in a horizontal direction. In addition to this most obvious

obvious distinction, they are more deeply serrated than those of all the other species, without excepting even *S. serratum*, and the reticulations are less apparent than is common in most of the individuals of this beautiful genus. The apophysis is so obsolete as scarcely to be distinguishable from the capsule, which in its form bears a great resemblance to that of *S. tenue*. Dr. Buchanan found this plant at Naram Hetty.

TAB. XXVI. Fig. 2.

- a. *Splachnum squarrosum*, natural size.
- b. leaf, magnified.
- c. capsule, magnified.

4. *PTEROGONIUM declinatum.*

Pterogonium caule repente, foliis imbricatis ovatis integerrimis mediotenùs uninervibus, capsulâ declinatâ, operculo incurvato.

Caules procumbentes, reptantes, ramosissimi, ramis vagis, numerosis, unguicularibus, adscendentibus, divisis, curvatis, teretibus, apicem versùs levitèr incrassatis, basi denudatis, indè foliosis. *Folia* pallidè viridia, laxiusculè imbricata, erecto-patula, ovata, breviter acuminata, plana, margine integerrima, nervo obscuro concolore ultra medium evanescente instructa; *perichætialia* reliquorum similia, sed aliquantùm angustiora, magis acuminata et lutescentia, basi rufescente. *Pedicellus* lateralis, ramorum prope medium ortus, unguicularis, erectus, rufo-fuscus, infernè lævis, supernè punctis elevatis scabrosus. *Capsula* oblonga, infra oram aliquantùm angustata, declinata, rufo-ferruginea, punctata, orâ incrassatâ. *Operculum* capsulæ concolor, ejusque instar

instar punctatum, conicum, curvulum. *Calyptra* tenuis, dilutè fusca, subulata, curvata, dimidiata, lævis. *Peristomium* dentibus sedecim, suberectis, e capsulæ membranâ interiore reticulatâ ortis, lineari-subulatis, luteis, transversè striatis, a basi ad medium longitudinalitèr fissis.

I have named this plant from its most obvious character, the drooping capsule, in which it differs from all the other species of this genus described by Hedwig or Bridel, and has, in consequence of it, so completely the appearance of a *Hypnum*, that no one would suspect its real family, without first examining it. There will also be found under the microscope a strong peculiarity in the circumstance of the teeth of the peristomium being cleft in a very curious manner.

Tab. XXVI. Fig. 3.

- a. *Pterogonium declinatum*, natural size.
- b. part of a branch, magnified.
- c. leaf.
- d. perichætil leaf.
- e. capsule.
- f. operculum.
- g. calyptra, with the operculum.
- h. teeth of the peristomium.

5. *PTEROGONIUM ambiguum.*

Pterogonium caule pendulo pinnato, foliis obovatis concavis uninnervibus, capsulâ terminali globosâ sessili, operculo planiusculo.

Caules semipedales et ultrâ, denudati, tenues, subflexuosi, debiles,

biles, penduli, pinnatim ramosi; rami ut plurimum alterni, vel rarius secundi, hinc illuc intervallis bi- tri-linearibus sectuncti, horizontales, circiter pollicares, aliis minoribus similimodo pinnati, foliosi. *Folia* laxè imbricata, erecto-patentia, obovata, breviter apiculata, valde concava, margine propè apicem involuto, cætera plano, ubique integerrimo, nervo obscuro ante apicem evanescente instructa; *perichætialia* erecta, ovato-lanceolata, acutiuscula, paullum modò concava, margine supernè revoluta, nervo ad apicem usque attingente percursa; omnia siccitate longitudinaliter striata. *Capsulæ* propemodum sessiles, foliis perichætialibus immersæ, ramorum brevissimorum reliquis immixtorum ad extremitates terminales, globosæ, rufo-fuscæ, venis anastomosantibus elegantè pictæ, orâ valdè contractæ, margine angusto, elevato. *Operculum* planum, aut obsoletissimè et obtusissimè umbonatum. *Peristomium* dentibus sedecim obcuneiformibus, luteis, transversim striatis, semper, quantum vidi, clausis, et nunquam vel erectis vel reflexis.

The capsules of this very singular moss have a remarkably contracted mouth, furnished with a narrow elevated margin, below which the operculum is situated; this is nearly flat, having an elevation in the centre so slight that it does not reach to the edge of the margin. The peristomium, which, on account of its minuteness, is very difficult to examine, has 16 obcuneiform, yellowish teeth placed close together in a horizontal direction, never, as far as I could discern, becoming erect, but resembling, in situation as well as in appearance, those of the *Funaria*. I have given this plant the name of *P. ambiguum*, as I cannot help still regarding it as uncertain to what genus it properly belongs, its terminal sessile capsules, its operculum, and its

its whole habit appearing to require that it should ultimately be removed from the *Pterogonia*, with which, on account of its peristomium, it did not appear possible to avoid associating it at present.

TAB. XXVI. Fig. 4.

- a. *Pterogonium ambiguum*, natural size.
- b. *capsuliferous branch*, magnified.
- c. *leaf*.
- d. *perichætial leaf*.
- e. *capsule*.
- f. *operculum*.
- g. *peristomium, with the capsule*.

6. *DICRANUM scoparium*. Hedw.

7. *POLYTRICHUM aloides*. Hedw.

8. *NECKERA sphærocarpa*.

Neckera caule pinnato, ramis abbreviatis, foliis ovatis acuminatis mediotenùs uninervibus, capsulis subglobosis subsessilibus secundis.

HABITAT in truncis arborum apud Kargoo. *D. Buchanan.*

Caules bi- tri-pollicares, penduli, ramosi; rami alterni, sparsi, remoti, horizontales, plerumque simplices et breves, longitudine tamen incertæ, paullùm flexuosi, apices versus attenuati. *Folia* undique laxè imbricata; superiora cauli appressa, apicibus tamen sæpiùs subsecundis, ovato-lanceolata, longè acuminata, ad apicem minutissimè serrulata, lutescenti-

tescenti-viridia, basi purpurascentia, inferiora patula, vel sæpè recurvato-patula, ex ovato breviter modò acuminata, integerrima, atro-viridia; omnia concava, sed margine juxta basin plano, nervo circiter medium evanescente instructa; *perichætialia* erecto-patula, pallidè luteo-virescentia; interiora majora, oblongo-lanceolata, acuminata, apicem versus subserrata, valdè concava, et aliquantùm crispata, nervo obscuro ante medium evanido; exteriora longè minora, lanceolata, plana, integerrima, et basi tantùm nervo brevissimo instructa. *Capsulæ* ramorum ad latera sitæ, semper secundæ, solitariæ, et plerumque intervallis majusculis junctæ, subglobosæ, læves, fusco-lutescentes, orâ incrassatâ, rubrâ, brevissimè pedunculatæ, ut prorsùs sessiles videantur, foliis perichætialibus multò breviores, iisque obtectæ, unde, seorsùm observatæ, *Phasco cuspidato* non sunt absimiles. *Operculum* conicum, acutum, parùm rugosum, internè striatum, basi annulo composito cinctum. *Peristomium* duplex, utrumque albicans, et nigro-fasciatum; interius, dentes sedecim filiformes, cum exterioribus, latioribus, brevioribus alternantes. *Semina* magna, sphærica, fusco-viridia, rugosa, quasi pulverè obtectæ, quod, si sub lente in aquâ conspiciantur, evidentissimum est. *Calyptra* nondum a me visa.

The affinity of this moss with the British *Neckera heteromalla* is too remarkable to escape notice; and it is most pleasant to the scientific observer of nature to find the artificial system of Genera so confirmed by individuals collected on the trunks of trees in England and in the distant regions of Nepal. The spherical capsule appears, however, a sufficient criterion to distinguish the present species from every other at present known.

TAB. XXVII. Fig. 1.

- a. *Neckera sphaerocarpa*, natural size.
- b. *part of a branch*, magnified.
- c. *upper leaf*, magnified.
- d. *apex of the same*, more highly magnified.
- e. *lower leaf*, magnified.
- f. *perichætial leaf*.
- g. *apex*, more highly magnified.
- h. *capsule and interior perichætial leaf*.
- i. *operculum*.
- k. *operculum seen internally with the annulus*.
- l. *part of the peristomium*.
- m. *seeds*.

9. *NECKERA flavescens.*

Neckera caule erecto pinnato, ramis simpliciusculis, foliis ovatis enervibus, capsulâ cylindraceâ erectâ, operculo subulato.

Caules tri- quinque- pollicares, erecti, pinnatim ramosi; rami vagi, plerumque alterni, elongati, paullum flexuosi, subcompressi, acuti, horizontales, nunc simplices, nunc aliis minoribus similiter instructi, undique foliosi. *Folia* laxiusculè imbricata, erecta, et cauli appressa, planiuscula, ovata, breviter acuminata, prorsus enervia, lutescentia; summa aureo-fulva; omnia siccitate nitentia, basi reticulata, margine integerrima; *perichætialia* reliquorum similia, sed minora, angustiora, et longissimè acuminata, recurvato-patula. *Pedicelli* in ramis siti, unciales, laterales, læves, erecti, tenuissimi, rufi. *Capsula* oblongo-cylindracea, tenuis, erecta, rufescens,

fescens, pulcherrimè reticulata. Operculum capsulæ concolor, eâque dimidio brevius, similiter reticulatum, e basi conicâ subulatum, obtusiusculum. Calyptra cylindraceo-conica, dilutissimè fusca, glabra, nuda, integra secedens.

Among the Neckerae Bridel enumerates no more than two species which have leaves imbricated on all sides, and upright pedunculated capsules, (*N. curtispindula*, and *N. dendroides*,) both of which are of too common occurrence, and are too easily distinguished, for there to be any necessity of pointing out the differences that separate them from *N. flavescens*, here figured, the name of which I have derived from the colour.

TAB. XXVII. Fig. 2.

a. *Neckera flavescens*, natural size.

b. part of a branch, magnified.

c. leaf.

d. perichatial leaf.

e. capsule.

f. operculum.

g. capsule covered with a calyptra.

10. NECKERA *tenuis*.

Neckera caule bipinnato, foliis imbricatis serratis: caulinis cordato-subrotundis basi bistriatis, capsulâ erectâ, operculo incurvo.

Caules procumbentes, repentes, palmares et ultrâ, variè flexuosi, cæspitiosi, implexi, ramosissimi. *Rami* horizontales, erectiusculi, distichi, vagè pinnati, sub-pollicares, longitudine tamen incertæ, minoribus eâdem ratione dispositis obsiti,

undique foliosi, siccitate incurvi et crispatuli. *Folia* lutescentia, nitida, laxiusculè imbricata, marginibus ab apice ad medium usque serrata; caulina majora, horizontalia, plana vel paullùm undulata, cordato-subrotunda, breviter apiculata, basi obsolete bistrata; ramea minora, concava, erecto-patula, siccitate magis appressa, ovata, mutica, prorsus enervia; *perichætialia* albicantia, lanceolata, longè acuminata, reflexa, apice modò serrata. *Pedicelli* in caulibus laterales, sesquipollicares, erecti, tenues, læves, rubri. *Capsula* pedicello concolor, reticulata, erecta, oblonga, orâ contractâ. *Operculum* ejusdem quoque coloris, e basi convexâ rostratum, rostro curvato, capsulâ triplò brevius. *Peristomium* breve, flavum, striatum.

Though I have named this plant from its very thin stem and branches, it has a peculiarity still more remarkable in the twisting of the branches when dry, in which I believe that no other species of *Neckera* participates with it. It belongs to the same division as that last mentioned, and is consequently immediately distinguishable from every other.

TAB. XXVII. Fig. 3.

- a. *Neckera tenuis*, natural size.
- b. part of a stem and branch, magnified.
- c. stem leaf.
- d. leaf of the branch.
- e. perichætial leaf.
- f. capsule.
- g. operculum.

11. *BARTRAMIA fontana*. Hedw.

12. *BARTRAMIA falcata*.

Bartramia caule subdiviso apice falcato, foliis quadrifariis ovato-lanceolatis serratis secundis, pedicellis caulem subæquantibus.

Caules densè cæspitosi, tripollicares et ultrà, nunc simplices, nunc infernè bis ter vagè dichotomi, tomento densò ferrugineo-fusco ad medium longitudinis obsiti, indè foliosi. *Rami* fastigiati, erecti, apicibus insignitèr falcatis. *Folia* lætè viridia, quadrifariam posita, laxiusculè imbricata, erecto-patula, apicibus tamen, præsertim siccitate, secundis, ovato-lanceolata, acuminata, concavo-carinata, margine ubique serrata, pulcherrimè reticulata, nervo valido, fusco, excurrente instructa; *perichætialia* vix discrepant, nisi quòd sint e basi ovatâ in acumen multò longius producta, apice solummodò serrata, et pallidè lutescentia. *Pedicelli* læves, e ramorum axillis caulis infra medium orti, pollicares et ultrà, sed longitudine vix ramos excedentes, fusci, erecti, vel basi flexuosi. *Capsula* globosa, subcernua, fusca, matura sulcata. *Operculum* deest. *Calyptra* integra, cylindræoconica, albicans, glabra. *Peristomium* fusco-rubescens.

This very distinct and beautiful species of a beautiful genus is most nearly allied to *B. fontana*, and particularly to the var. β . of the plant figured in Mr. Turner's *Muscologia Hibernica* (t. 10. f. 1.), but it differs in having the leaves more loosely imbricated, always disposed in four rows, with summits slightly incurved, and pointing the same way, as is particularly observable in dried specimens.

specimens. They are also serrated throughout their whole length. Besides this, the ends of the branches are remarkably incurved; which furnishes so strong and obvious a character of the plant that I have derived the specific name from that circumstance.

TAB. XXVII. Fig. 4.

- a. *Bartramia fulcata*, natural size.
- b. b. parts of the branch, magnified.
- c. leaf.
- d. perichatial leaf.
- e. capsule.
- f. calyptra.

13. BRYUM *heterophyllum*.

Bryum caule subdiviso, foliis serratis: infimis subrotundis; summis lineari-acuminatis, capsulâ cernuâ, operculo convexo.

Caules cæspitiosi, simplices, vel prope basin vagè divisi, unciales et ultra, per dimidiam ferè longitudinem terrâ immersi et aphylli; inde foliosi. *Folia* majuscula, atro-purpurea, margine incrassata, purpurea, serrata, nervo valido purpureo instructa, elegantissimè reticulata, madore erecto-patula, siccitate crispatula. *Foliorum* forma, et nervi longitudo, mirè variant; *inferiora* ovata seu ovato-subrotunda, apice modò minutè serrata, nervo circa medium evanescente instructa; *intermedia* ovato-elliptica, magis evidentè serrata, nervo infra apicem evanescente; *superiora* longe-lanceolata, argutè serrata, nervo valido excurrente; omnia acuta. *Pedicellus* terminalis, erectus, uncialis, lævis, infernè croceus, supernè rutilans. *Capsula* ovato-oblonga, subcernua, fusca.

Operculum

Operculum capsulâ pallidius, conicum, umbone minuto, obliquo terminatum. *Peristomium* exterius dentibus fusco-flavescentibus, transversim striatis; interius dentibus membranaceis, flavis, similiter striatis.

The singularly variable form of the leaves offers so strong a character of this moss that I have derived from it the specific name. In size and in general appearance, when dry, it considerably resembles *Mnium stellare* of Hedwig, near which it must be arranged in the system.

TAB. XXVIII. Fig. 1.

- a. *Bryum heterophyllum*, natural size.
- b. upper leaf, magnified.
- c. intermediate leaf.
- d. lower leaf.
- e. portion of the leaf, highly magnified.
- f. capsule.
- g. operculum.

14. *LESKEA flexilis.*

L. flexilis. Hedw. *Sp. Musc.* p. 234. t. 58

I am induced to offer a figure of the leaves of this very curious moss, the specimens gathered by Dr. Buchanan differing from those figured by Hedwig, in having their leaves furnished at the base with a very evident, though short nerve, and tipped in many instances with a piliform mucro. Dr. Buchanan found it upon trees mixed with *Pterogonium ambiguum*, and, like Dr. Swartz, found it only barren. I have compared the individual
here

here figured with original specimens in Mr. Turner's valuable Herbarium, and find them agree so precisely in every particular, excepting those just mentioned, as to leave no doubt of their identity.

TAB. XXVIII. Fig. 2.

a. *small branch, magnified.*

b. b. *leaves.*

15. *HYPNUM proliferum.*

16. *HYPNUM Buchanani.*

Hypnum caule procumbente, ramis erecto-patulis, foliis ovatis acuminatis subserratis uninervibus, capsulâ cernuâ, operculo conico obtuso.

Caules bi- tri- pollicares, adscendentes, pinnatim ramosi. *Rami* erecti, circitèr unguiculares, subdistichi, sparsi, plerumque simplices, sed interdum repetito-divisi, filiformes, teretes, acuminati, undique foliosi. *Folia* lutescenti-viridia, nitida, undique laxè imbricata, erecta, plana, ovata, longè acuminata, nervo tenui, viridi, ad medium usque percurrente instructa, apices versus subserrata, et apicibus, præcipuè in ramis superioribus, flexuosis; *caulina* majora, latiora, ad basin striata; *ramea* angustiora; omnia elegantèr reticulata; *perichætialia* lineari-lanceolata; longè acuminata, apice torta et reflexa. *Pedicelli* in ramis orti, frequentes, subunguiculares, rufi, erecti, læves. *Capsulæ* rufo-fuscae, cernuæ, oblongæ, reticulatæ. *Operculum* conicum, obtusum, capsulæ concolor, et similiter reticulatum. *Calyptra* dimidiata, subulata, fuscilla, lævis.—Exemplarium ætas haud satis provecta peristomium investigare vetuit.

I am at a loss to say which *Hypnum* approaches most nearly to that here figured, as it belongs to the division "ramis teretibus," the most numerous and intricate of this immense genus. I flatter myself, however, with the hopes that the figure and character here given will serve to distinguish it from all others. I have named it after Dr. Francis Buchanan, who found all the mosses that form the subject of this paper.

TAB. XXVIII. Fig. 3.

- a. *Hypnum Buchanani*, natural size.
- b. part of the branch, magnified.
- c. stem leaf.
- d. perichæatial leaf.
- e. capsule, with the operculum.
- f. calyptra.

17. *HYPNUM crispatum*.

Hypnum caule adscendente, ramis erectis aduncis, foliis falcato-secundis lanceolatis serratis uninervibus siccitate crispis.

Caules adscendentes, simplices, vel bis ter dichotomi. *Rami* erecti, apicibus incurvatis, undique foliosi. *Folia* dilutè fusco-flavescentia, nitidiuscula, undique imbricata, laxè disposita, falcata, secunda, oblongo-lanceolata, acuminata, nervo concolore infra apicem evanescente instructa, et striis aliquot longitudinalibus notata; per totum marginem argutè serrata, plana, vel sæpè concavo-carinata, paullùm undulata, siccitate insignitè crispata. *Fructificationem* non vidi.

This Hypnum, of which I possess but very imperfect specimens, belongs evidently to the division "foliis reflexis," and appears so different from all the individuals composing that section, that I have ventured upon describing it as a new species. It is nearly allied, both in form and general habit, to *H. rugosum* of *Fl. Brit.* (not *Hedw.*), but may be easily distinguished from it by the form of the leaves, which are considerably more narrow, and by the serratures which extend the whole length of the margin, whereas the leaves of *Hypnum rugosum* are entire

TAB. XXVIII. Fig. 4.

- a. *Hypnum crispatum*, natural size.
- b. part of a branch, magnified.
- c. c. leaves.

XXV. EXTRACTS